GENERAL DYNAMICS
Armament Systems

Percussion/Electric Gun Design for Comanche

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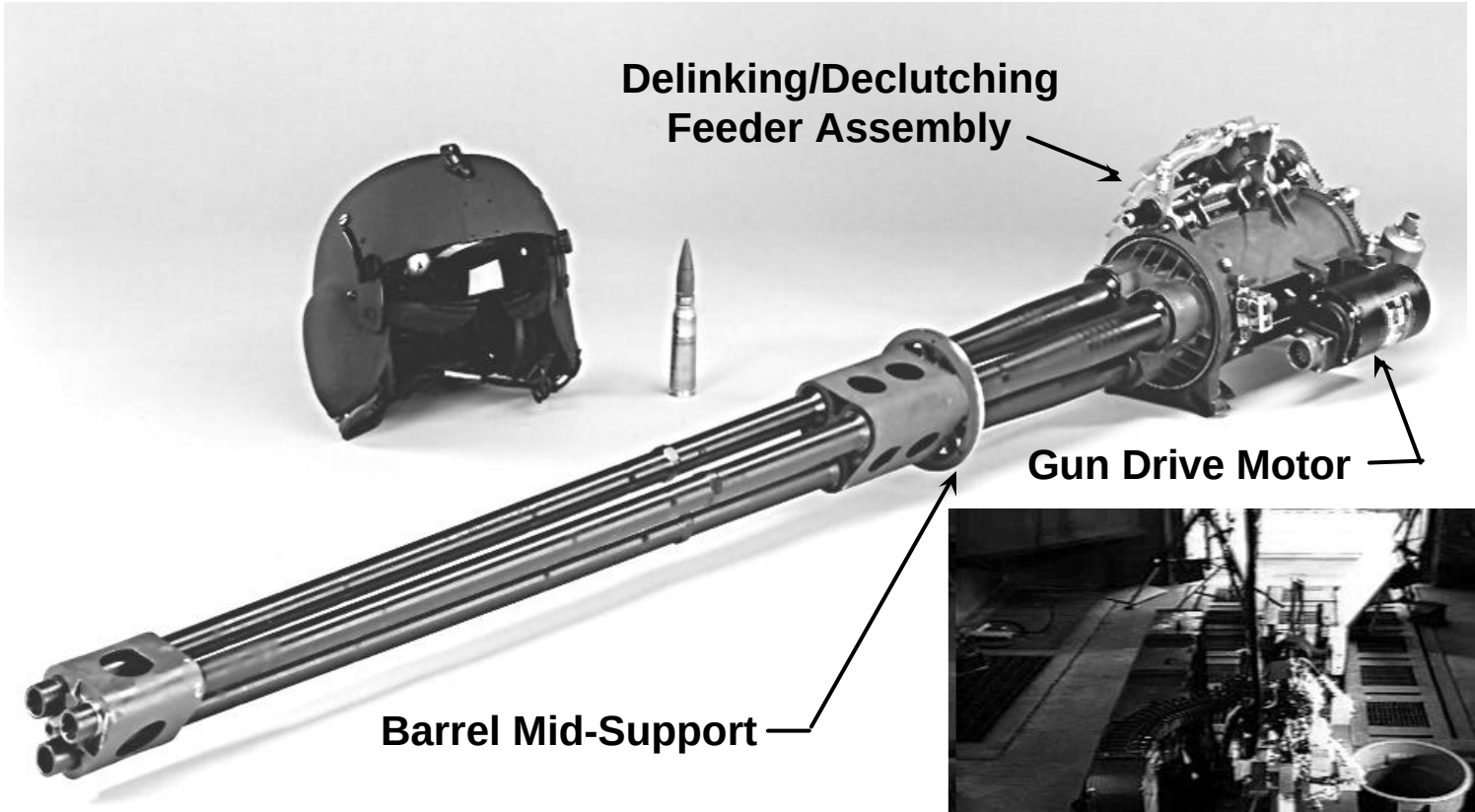
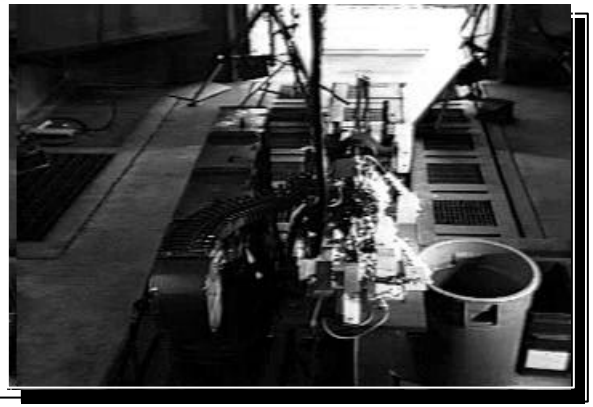
XM301 20mm Gun & Accessories





XM301 Gun Features

- Design Optimized to Mission Requirements (Rate of Fire & Burst Schedule)
- Light Weight/Low Profile (>40% lighter than M197)
  - ➢ Advanced casting technology
  - ➢ Breech Locks Integral to Barrel
- Low Parts Count (~50% less than M197)
- Externally Powered
- Simple/Quick to Assemble & Strip - No Special Tools

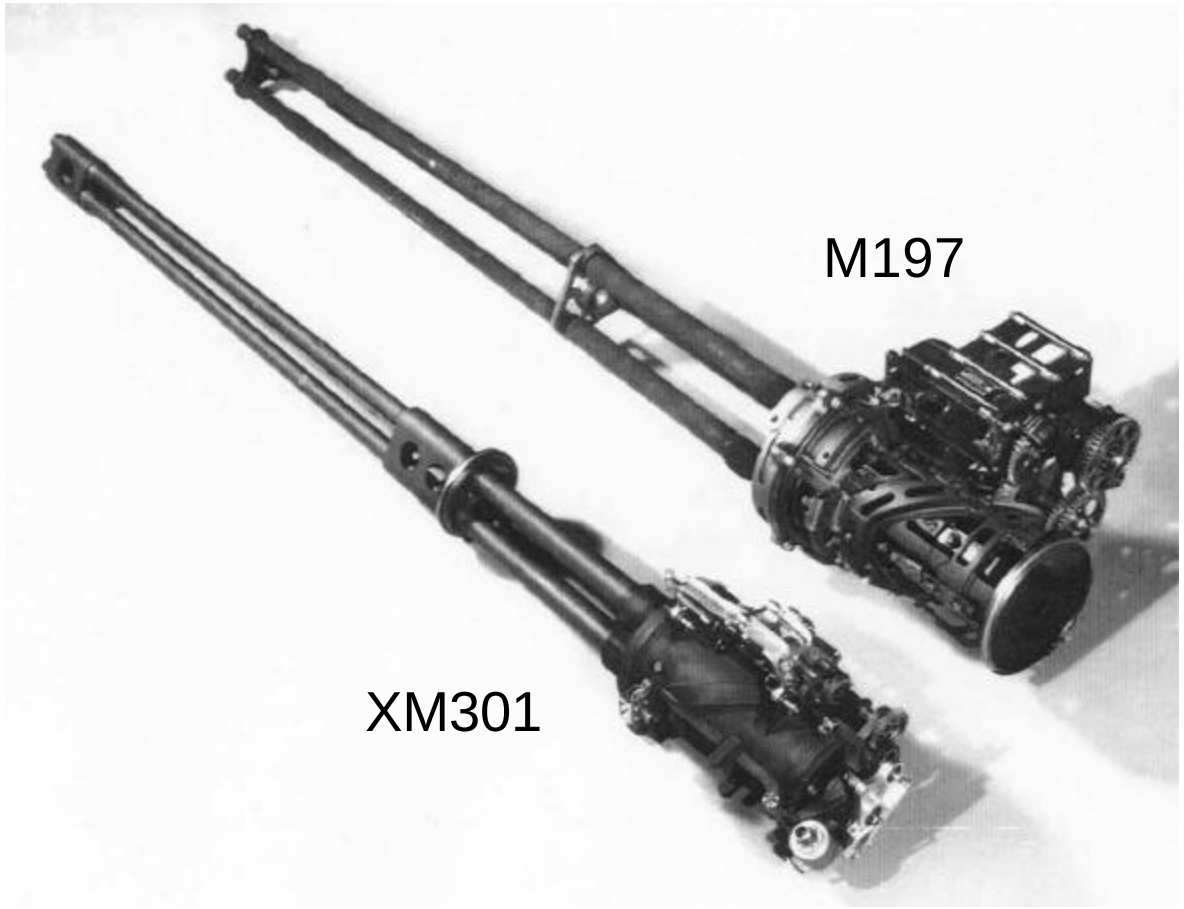
XM301 Gun Performance

● Firing Rate	1500 spm nominal
● Drive Power (Gun)	2 HP @ 1500 spm
(Gun & Feeder)	3 HP @ 1500 spm
● Lubrication Interval	5,000 Rounds
● Ignition	Percussion and electric

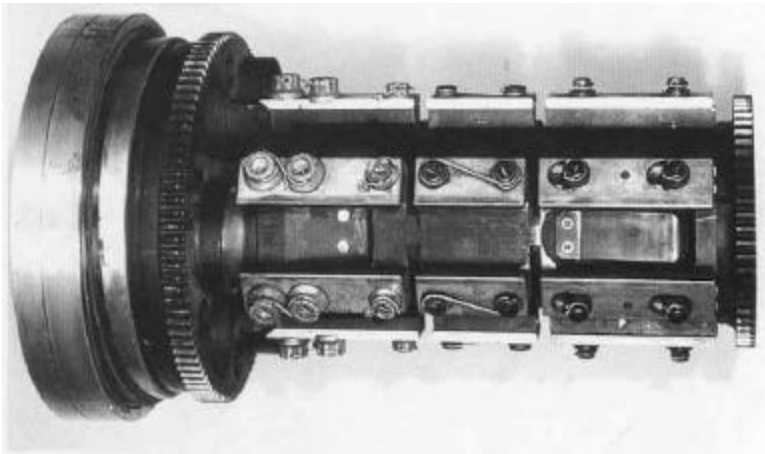
XM301 Gun Characteristics

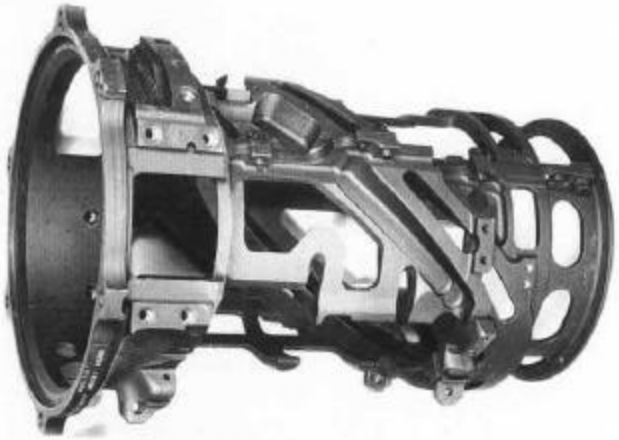
Gun Type	**Gatling, 3-Barrel, 20mm**
Weight (Gun only)	**80.6 lb. (+ ~ 2 lbs for percussion)**
(with Feeder)	**103.2 lb.**
Length	**72.2 in.**
Diameter @ Main Bearing	**6.93 in.**
Barrel Length (Overall)	**61.1 in.**
(Projectile Travel)	**56.7 in.**
Rifling	**Std. 20mm Gain Twist**
Bolt Type	**Rotating Lock/Telescoping Body**
Clearing	**Declutching Feeder**
Interoperability	**M50s, PGUs, M220, M246, Mk149, XM-1031, XM-1032**

Comparison of XM301 to M197

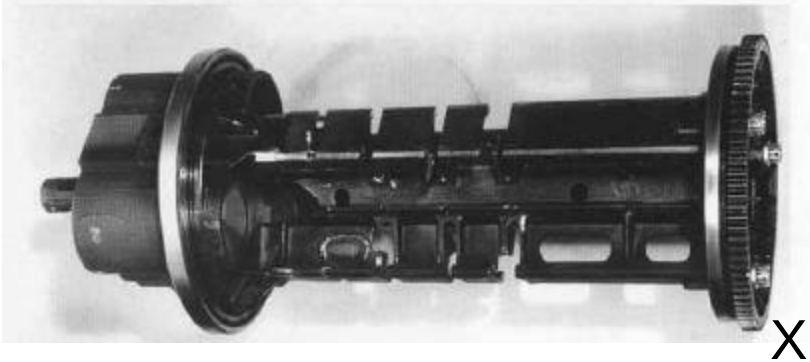


XM301 & M197 Rotors & Housings





M197



XM301

XM301/M197 Weights & Parts Count

	Weight (lb)			Parts Count	
Subassembly	M197	XM301		M197	XM301
Gun Subassembly	70.6	23.3		264	77
Barrels & Clamps	57.9	57.3	93.4	17	12
Feeder	22.5	12.8		129	125
Gun Drive & Motor	11.7	6.9		50	7
Recoil Adapter(s)	11.8	2.9		27	9
Totals	174.5	103.2		487	230

XM301 Gun is >40% lighter and contains ~50% fewer parts.

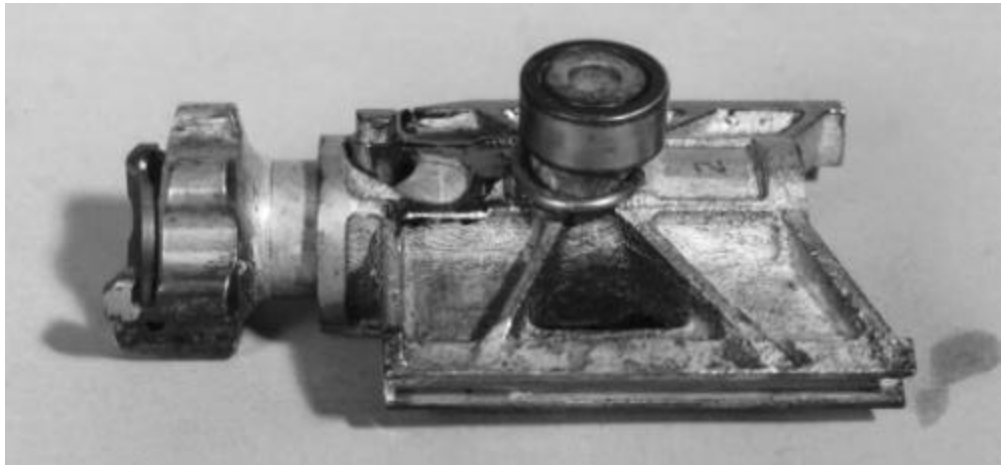
Percussion/Electric Gun Design (PEGS)

- XM301 20mm gun for Comanche is being upgraded:
  - ➢Currently fires electrically primed ammunition
  - ➢20,000+ rounds fired on prototype gun
  - ➢1996 study demonstrated feasibility of PEGS
  - ➢ARDEC to release ammunition contract for XM1031/XM1032 in summer of 2001
  - ➢Will interchangeably fire electrically and percussion primed ammunition

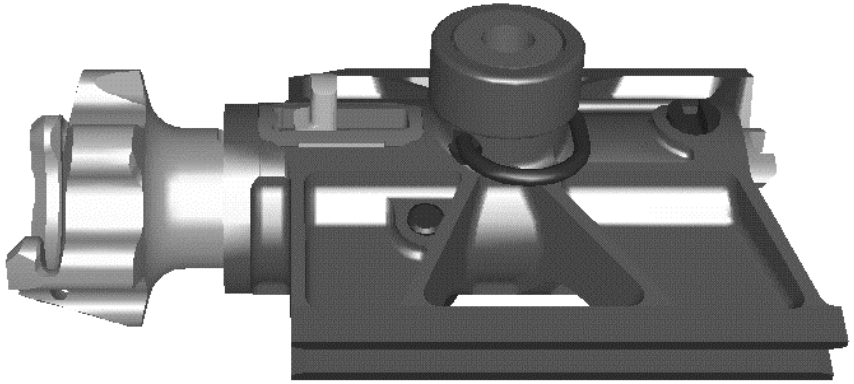
Technical Challenges of PEGS

- Percussion sear ~1.4 msec before electric sear
- Electrical isolation of firing pin
- Packaging of percussion firing mechanism
- Incorporate percussion safing & arming
- Accommodate dry cycling/firing

Comparison of Bolt Assemblies



Original bolt assembly for electrically primed ammunition



New bolt assembly for both percussion primed and electrically primed ammunition